

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 7,101,795 B1  
APPLICATION NO. : 09/678266  
DATED : October 3, 2000  
INVENTOR(S) : Xi et al.

Page 1 of 5

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title Page, Item (63), Related U.S. Application Data: Please add the following priority data:

--Continuation-in-part of application No. 09/605,593, filed on Jun. 28, 2000,  
now Pat. No. 6,551,929.--

Title Page, Item (56), References Cited, U.S. PATENT DOCUMENTS: Please include the following references:

|              |         |                    |         |
|--------------|---------|--------------------|---------|
| --6,372,598  | 4/2002  | Kang et al.        | 438/399 |
| 6,369,460    | 4/2002  | Adetutu et al.     | 257/382 |
| 6,368,954    | 4/2002  | Lopatin et al.     | 438/627 |
| 6,358,829    | 3/2002  | Yoon et al.        | 438/597 |
| 6,355,561    | 3/2002  | Sandhu et al.      | 438/676 |
| 6,342,277    | 1/2002  | Sherman            | 427/562 |
| 6,333,260    | 12/2001 | Kwon et al.        | 438/643 |
| 6,284,646    | 9/2001  | Leem               | 438/629 |
| 6,207,487    | 3/2001  | Kim et al.         | 438/283 |
| 6,042,652    | 3/2000  | Hyun et al.        | 118/719 |
| 5,306,666    | 4/1994  | Izumi              | 437/192 |
| 2003/0072975 | 4/2003  | Shero et al.       | 428/704 |
| 2003/0049942 | 3/2003  | Haukka et al.      | 438/778 |
| 6,534,395    | 3/2003  | Werkhoven et al.   | 438/627 |
| 6,482,740    | 11/2002 | Soininen et al.    | 438/686 |
| 6,482,733    | 11/2002 | Raaijmakers et al. | 438/633 |
| 6,482,262    | 11/2002 | Elers et al.       | 117/84  |
| 6,475,910    | 11/2002 | Sneh               | 438/685 |
| 6,475,276    | 11/2002 | Elers et al.       | 117/84  |
| 6,468,924    | 10/2002 | Lee et al.         | 438/763 |
| 6,451,695    | 9/2002  | Sneh               | 438/685 |
| 6,447,933    | 9/2002  | Wang et al.        | 428/635 |
| 6,423,619    | 7/2002  | Grant et al.       | 438/589 |
| 6,420,189    | 7/2002  | Lopatin            | 438/2   |
| 6,399,491    | 6/2002  | Jeon et al.        | 438/680 |
| 6,391,785    | 5/2002  | Satta et al.       | 438/704 |
| 2003/0032281 | 2/2003  | Werkhoven et al.   | 438/640 |
| 2003/0031807 | 2/2003  | Elers et al.       | 427/569 |
| 2003/0013320 | 12/2002 | Leskela et al.     | 427/250 |
| 2002/0187631 | 12/2002 | Kim et al.         | 438/637 |
| 2002/0187256 | 12/2002 | Elers et al.       | 427/99  |

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Title Page, Item (56), (cont'd)

|              |         |                    |            |
|--------------|---------|--------------------|------------|
| 2002/0182320 | 1/2003  | Kim et al.         | 438/778    |
| 2002/0162506 | 11/2002 | Sneh et al.        | 118/715    |
| 2002/0155722 | 10/2002 | Satta et al.       | 438/704    |
| 2002/0121697 | 9/2002  | Marsh              | 257/751    |
| 2002/0117399 | 8/2002  | Chen et al.        | 205/125    |
| 2002/0109168 | 8/2002  | Kim et al.         | 257/295    |
| 2002/0106846 | 8/2002  | Seutter et al.     | 438/200    |
| 2002/0105088 | 8/2002  | Yang et al.        | 257/774    |
| 2002/0094689 | 7/2002  | Park               | 438/694    |
| 2002/0090829 | 7/2002  | Sandhu et al.      | 438/761    |
| 2002/0076837 | 6/2002  | Hujanen et al.     | 438/3      |
| 2002/0076507 | 6/2002  | Chiang et al.      | 427/569    |
| 2002/0061612 | 5/2002  | Sandhu et al.      | 438/151    |
| 2002/0055235 | 5/2002  | Agarwal et al.     | 438/430    |
| 2002/0052097 | 5/2002  | Park               | 438/507    |
| 2002/0048880 | 4/2002  | Lee                | 438/253    |
| 2002/0037630 | 3/2002  | Agarwal et al.     | 438/460    |
| 2002/0031618 | 3/2002  | Sherman            | 427/569    |
| 2002/0019121 | 2/2002  | Pyo                | 438/618    |
| 2002/0007790 | 1/2002  | Park               | 118/715    |
| 2002/0004293 | 1/2002  | Soininen et al.    | 438/584    |
| 2002/0000598 | 1/2002  | Kang et al.        | 257/301    |
| 2001/0054769 | 12/2001 | Raaijmakers et al. | 257/758    |
| 2001/0054730 | 12/2001 | Kim et al.         | 257/301    |
| 2001/0029094 | 10/2001 | Mee-Young et al.   | 438/597    |
| 2001/0028924 | 10/2001 | Sherman            | 427/255.28 |
| 2001/0024387 | 9/2001  | Raaijmakers et al. | 356/200    |
| 2001/0009695 | 7/2001  | Saanila et al.     | 427/255.39 |
| 2001/0002280 | 5/2001  | Sneh               | 427/255.28 |
| 6,635,965    | 10/2003 | Lee et al.--       |            |

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Title Page, Item (56), References Cited, FOREIGN PATENT DOCUMENTS: Please include the following references:

|                |          |
|----------------|----------|
| -- WO 01/29893 | 4/2001   |
| WO 01/29891    | 4/2001   |
| JP 2001/111000 | 4/2001   |
| WO 02/45167    | 6/2002   |
| WO 02/067319   | 8/2002   |
| WO 01/66832    | 9/2001   |
| EP 1167569     | 1/2002-- |

Title Page, Item (56), References Cited, OTHER PUBLICATIONS: Please include the following references:

--Klaus, et al. "Atomically Controlled Growth of Tungsten and Tungsten Nitride Using Sequential Surface Reactions," Applied Surface Science, 162-163 (2000) 479-491.

"Pulsed Nucleation for Ultra-High Aspect Ratio Tungsten Plugfill"; San-Hyeob Lee et al.; Materials Research Society, 2002, 649-653.

Yang et al. "Atomic Layer Deposition of Tungsten Film from  $WF_6/B_2H_6$ : Nucleation Layer for Advanced Semiconductor Device," Conference Proceedings ULSI XVII (2002) Materials Research Society.--

Column 1, Line 6: Before Background of the Disclosure, insert

--This application is a continuation-in-part of U.S. Patent Application Serial No. 09/605,593, filed June 28, 2000, now issued as U.S. Patent No. 6,551,929.--

Column 5, Line 13: Change " $A_{ax}$ " to -- $Aa_x$ --

Column 5, Line 22: Change "to" to -- $t_1$ --

Column 7, Claim 1, Line 34: Before "layer", insert --nucleation layer and a bulk deposition--

Column 7, Claim 1, Line 36: Before "nucleation", insert --refractory metal--

Column 7, Claim 1, Line 38: Delete "atop of said nucleation layer,"

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 7, Claim 1, Line 39: Before "employing", insert --on said nucleation layer by--

Column 7, Claim 1, Line 40: Change "subject said nucleation layer to a bulk deposition of a compound" to --bulk deposit refractory metal--

Column 7, Claim 2, Line 43: Delete "forming atop of said nucleation layer includes forming"

Column 7, Claim 2, Line 45: Before "employing", insert --is deposited--

Column 7, Claim 3, Line 46: Delete "forming atop of said nucleation layer includes forming"

Column 7, Claim 3, Line 48: Before "employing", insert --is deposited--

Column 7, Claim 4, Line 50: Delete "introducing said first and second gases therein so as to purge said processing chamber of said first reactive gas by"

Column 8, Claim 4, Line 1: Change "therein," to --into the processing chamber after exposing said substrate to the first reactive gas and--

Column 8, Claim 6, Line 9: Change "a" to --the refractory metal--

Column 8, Claim 6, Line 10: Before "subsequently", insert --and--

Column 8, Claim 7, Line 15: Change "a" to --the refractory metal--

Column 8, Claim 9, Line 22: Change "subject" to --subjecting--

Column 8, Claim 10, Line 24: Before "layer", insert --nucleation layer and a bulk deposition--

Column 8, Claim 10, Line 27: Before "while", insert --wherein said second reactive gas comprises a refractory metal selected from the group consisting of titanium (Ti) and tungsten (W),--

Column 8, Claim 11, Line 38: Delete "said second reactive gas includes a refractory metal and"

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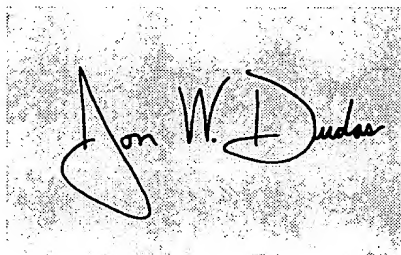
Column 8, Claim 11, Line 40: Change "includes" to --comprises--

Column 8, Claim 12, Line 42: Delete "selected from the group consisting of titanium (Ti) and"

Column 8, Claim 13, Line 46: Delete "first"

Signed and Sealed this

Thirteenth Day of February, 2007

A handwritten signature in black ink, reading "Jon W. Dudas", is written over a rectangular area with a light gray, textured background.

JON W. DUDAS

*Director of the United States Patent and Trademark Office*